PROJECT 1108-17--CODE LETTERS FOR PROGRESS REPORT 96
AUGUST 1, 1962

Company - Mill	Machine No.	Code Letter
The Chesapeake Corporation--West Point	1	--
Continental Can Company, Inc.--Hopewell	1	I
--Hodge	1	E
Crown Zellerbach Corporation--Baltimore	1	C
--Baltimore	2	W
--Bogalusa	4	G
--Lebanon	1	--
--Lebanon	2	M
International Paper Company--Arecibo	F	J
--Bastrop	1	A
--Bastrop	2	F
--Georgetown	1	X
The Mead Corporation--Harriman	1	H
--Knoxville	1	B
--Lynchburg	2	O
--Sylva	1	V
Olin Mathieson Chemical Corporation--Monroe	1	--
--Monroe	2	--
Owens-Illinois Glass Company--Big Island	3	N
--Tomahawk	1	D
--Tomahawk	2	K
--Tomahawk	3	R
Packaging Corporation of America--Filer City	1	Q
--Filer City	2	U
St. Joe Paper Company--Port St. Joe	1	L
St. Regis Container Corporation Mill Division--Coshocton	1	Y
Union Bag-Camp Paper Corporation--Savannah	2	T
West Virginia Pulp and Paper Company--Covington	6	S
--Covington	7	--
--Charleston	--	--
Weyerhaeuser Company North Carolina Division--Plymouth	3	P

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Report 96

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

August 1, 1962

TABLE OF CONTENTS

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous evaluation of corrugating medium are now being prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis. This new system was initiated on August 1, 1961. This sixth report under the new system presents results obtained during the months of June and July, 1962.

During this sixth bimonthly period, 183 rolls of corrugating medium representing the production of twenty-five machines were evaluated. A tabulation of the number of rolls submitted from each machine during the months of June and July, 1962, is given in Table I. In connection with the data given in Table I, it should be mentioned that, effective September 1, 1961, at the request of the Technical Committee, the limit on the number of rolls submitted for evaluation from each machine during a given month was reduced from six to four.

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush (conditioned after fluting), H. and D. flat crush on single-faced board, and runnability. Runnability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runnability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runnability was obtained--i.e., no ruptured flutes. If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch.

TABLE I

NUMBER OF ROLLS OF CORRUGATING MEDIUM SUBMITTED
FOR EVALUATION FROM EACH MACHINE

June and July, 1962

Machine Code	Number of Rolls
A	6
B	8
C	8
D	10
E	4
F	7
G	4
H	8
I	9
J	12
K	8
L	8
M	4
N	8
O	10
P	7
Q	9
R	8
S	7
T	7
U	9
V	4
W	8
X	8
Y	2
Total	183

Flat crush was determined on the single-faced board obtained at a speed of 600 f.p.m. with minimum tension. The flat crush results, in addition to supplying information about quality, will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

For each participating machine, the current machine averages associated with the current period are shown for each test in Table II and presented graphically in Fig. 1 to 4. The current machine average is the average of the test results obtained on all rolls of corrugating medium evaluated from a given machine during the current period. In addition to showing the test data obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average for each test is the average of the test results for all machines participating in the study during a given period. The cumulative F.K.I. average for each test is determined by averaging the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index for each test is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

The test results obtained on the sample lots submitted from the production of individual machines during June and July, 1962, are shown in Tables III through XXVII for Machines A through Y, respectively. The maximum, minimum, and average

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
June and July, 1962

Mill Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	27.1	11.0	41.2	36.8
B	26.5	11.3	33.7	31.1
C	27.8	10.0	34.1	30.6
D	26.8	10.1	37.0	33.2
E	27.8	10.0	40.0	36.2
F	26.8	10.8	38.5	34.7
G	27.4	10.8	34.0	32.8
H	27.4	10.6	35.2	31.8
I	27.3	11.1	38.3	35.8
J	26.9	9.7	31.6	31.1
K	26.8	10.1	38.4	34.3
L	27.4	10.8	35.2	32.9
M	27.0	10.0	34.8	31.7
N	26.7	10.3	37.1	33.8
O	27.0	10.1	37.7	34.7
P	26.7	10.0	36.9	34.5
Q	27.0	10.2	34.7	31.0
R	27.1	10.5	36.8	34.2
S	27.1	10.3	36.7	33.6
T	27.0	9.2	35.3	31.2
U	26.9	9.5	35.7	32.6
V	27.6	10.5	36.2	33.3
W	27.8	9.9	35.3	31.8
X	27.6	10.4	38.4	34.7
Y	27.5	10.5	36.4	35.4
Current F.K.I. Average	27.2	10.3	36.4	33.3
Cumulative F.K.I. Average	27.2	10.2	36.6	33.1
F.K.I. Index, %	100.0	100.7	99.4	100.6

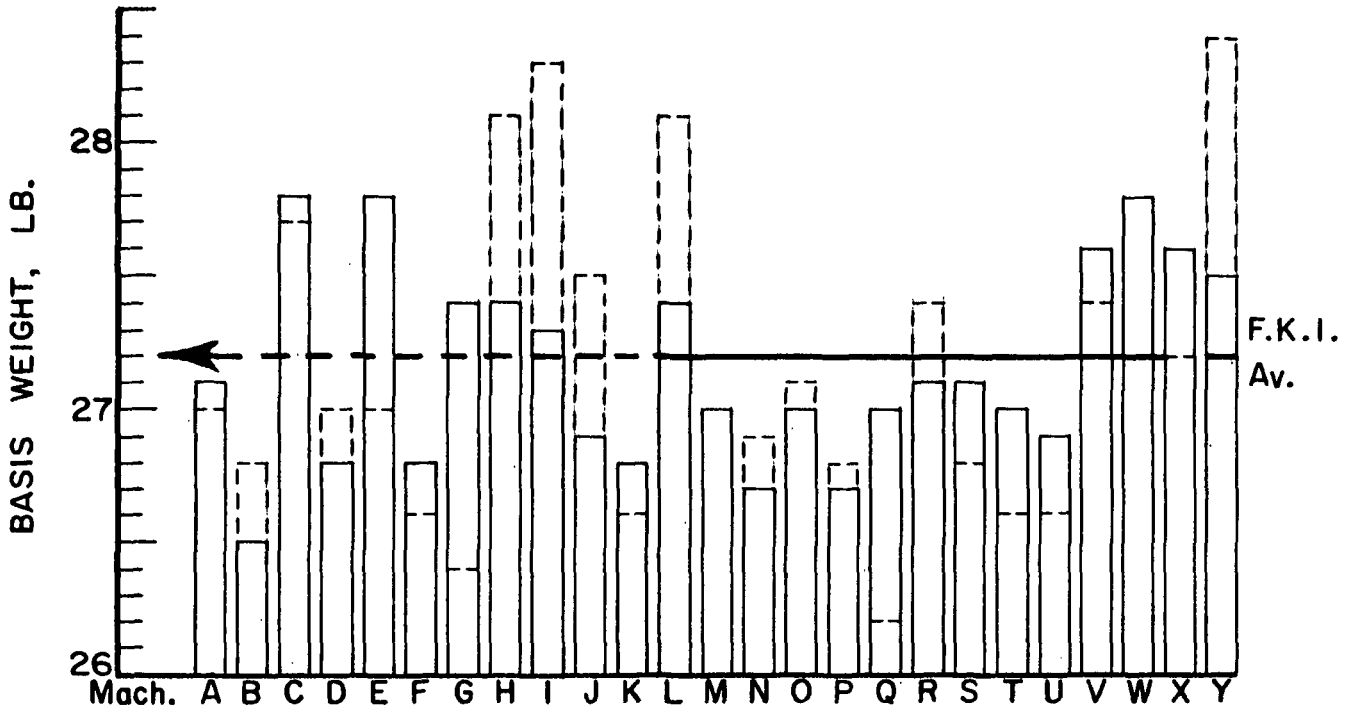

Figure 1. Comparison of Basis Weight Results

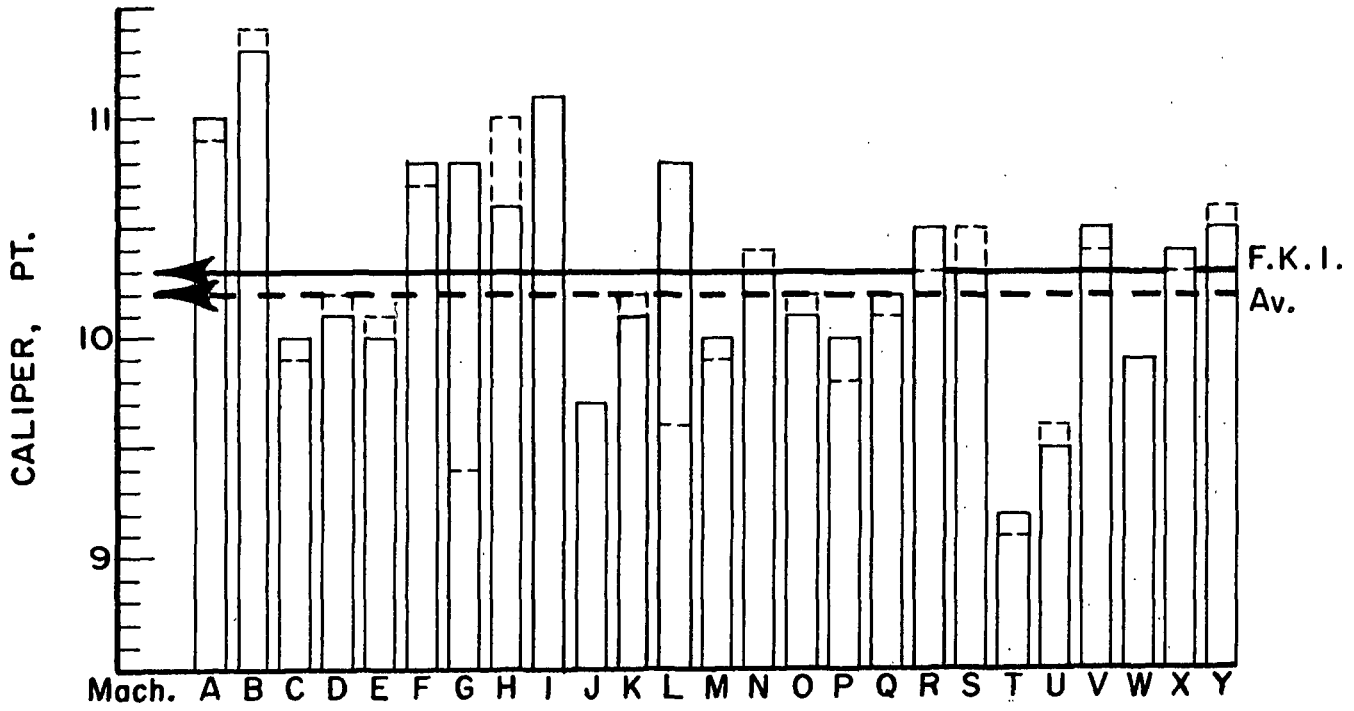

Figure 2. Comparison of Caliper Results

——— Current machine average

- - - - Cumulative machine average

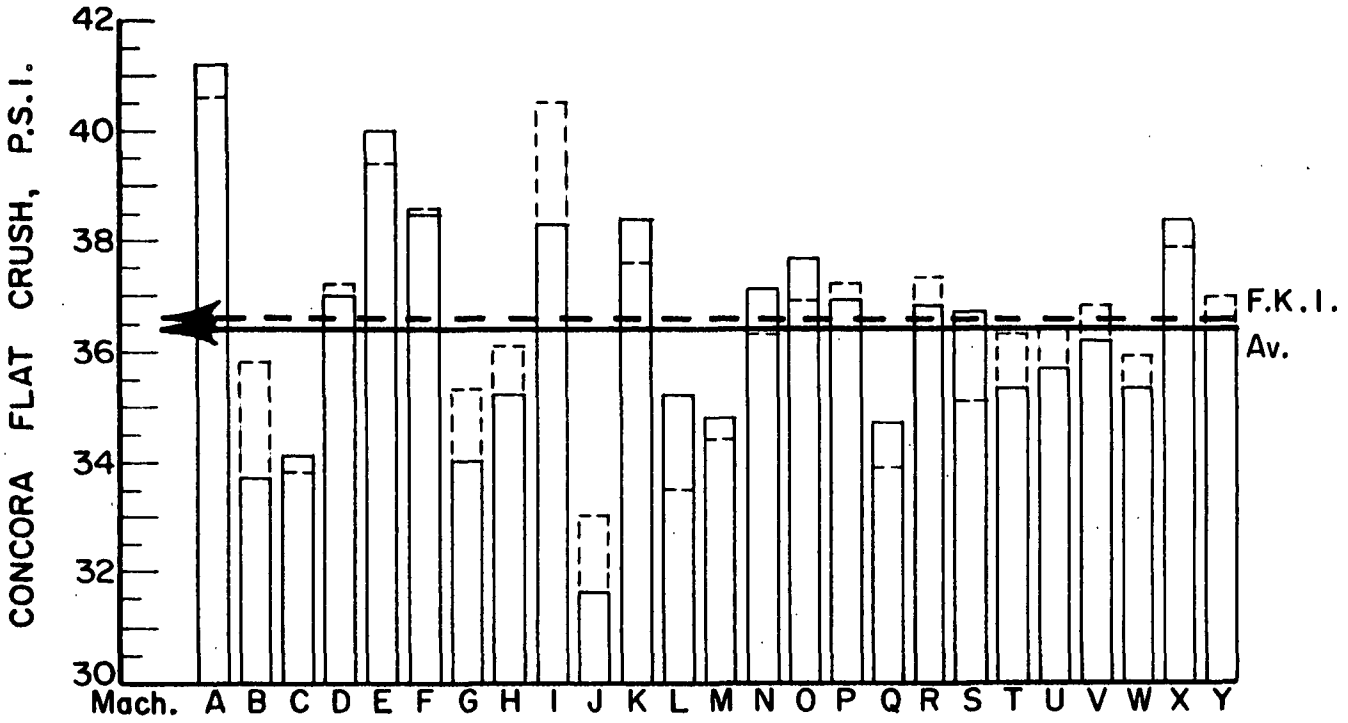

Figure 3. Comparison of Concora Flat Crush Results

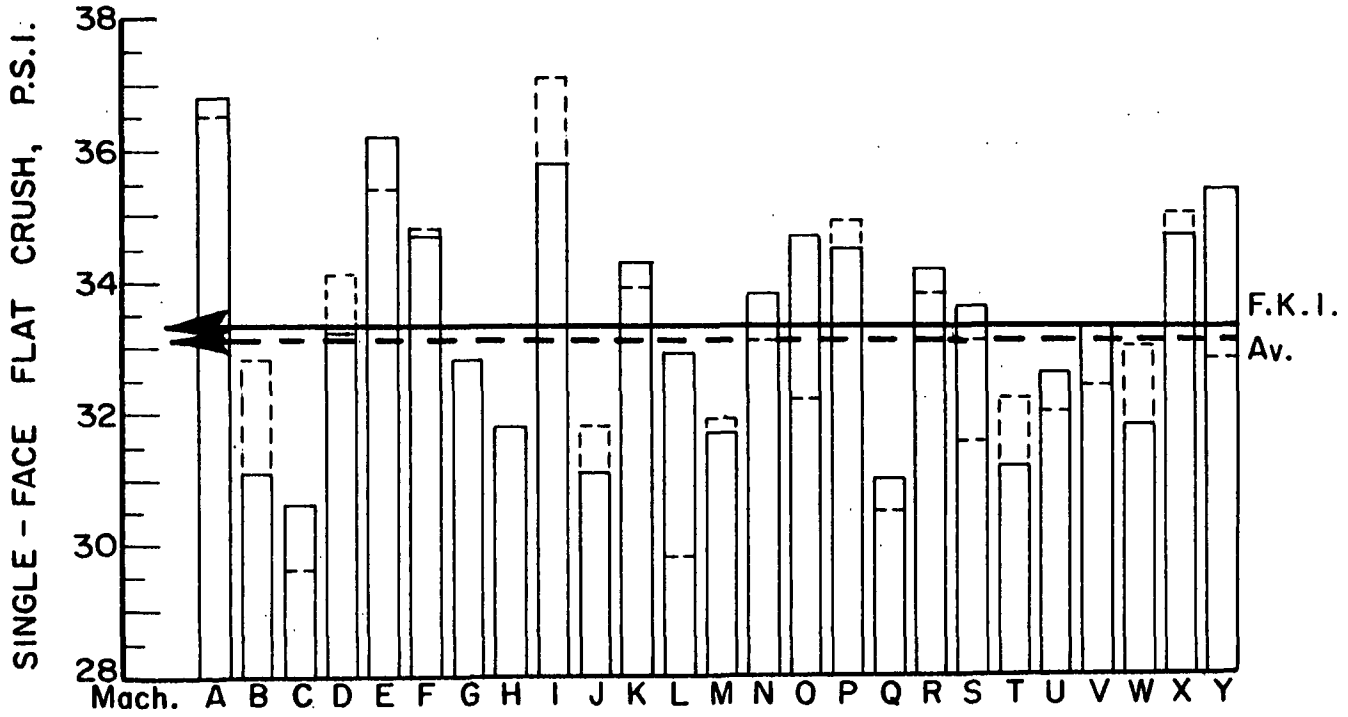

Figure 4. Comparison of Single-Face Flat Crush Results

——— Current machine average
- - - - Cumulative machine average

TABLE III

SUMMARY OF TEST RESULTS FOR MACHINE A
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
A-1	5-24-62	6- 1-62	663	26.8	11.2	10.1	10.9	42.0	38.4	40.6	39.2	34.6	36.2	1
A-2	5-31-62	6- 8-62	664	27.6	12.0	11.1	11.6	42.6	34.8	39.8	35.6	31.6	34.5	1/2
A-3	6- 7-62	6-13-62	665	27.1	11.1	10.3	10.8	44.4	40.2	41.6	38.8	37.4	38.0	1
A-4	6-15-62	6-21-62	666	27.0	11.5	10.2	10.9	44.4	36.0	41.0	37.2	34.6	35.6	1
A-5	6-25-62	7- 3-62	667	26.5	11.0	10.5	10.8	45.6	35.4	40.8	38.8	34.0	36.4	1-1/2
A-6	7-13-62	7-23-62	668	27.4	12.0	10.5	11.1	45.6	40.8	43.1	41.6	38.8	39.9	1-1/2
Current Machine Average				27.1			11.0			41.2			36.8	
Cumulative Machine Average				27.0			10.9			40.6			36.5	
Machine Factor, %				100.2			101.0			101.5			100.6	
Machine Index, %				99.4			107.5			112.5			110.9	

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
June and July, 1962

B-1	5-31-62	6- 8-62	731	26.6	12.1	11.0	11.5	35.4	29.4	32.3	32.6	30.0	31.2	1-1/2
B-2	5-31-62	6- 8-62	732	26.6	12.1	11.1	11.6	36.6	31.2	34.3	31.8	30.2	31.0	1-1/2
B-3	6- 4-62	6-11-62	739	26.2	11.6	10.6	11.0	36.0	31.8	34.1	32.6	30.4	31.0	1
B-4	6- 4-62	6-11-62	740	26.2	12.0	10.6	11.3	36.0	32.4	33.8	30.8	28.6	30.0	1-1/2
B-5	6-21-62	6-28-62	747	26.2	12.4	10.3	11.5	36.6	33.6	34.9	31.4	30.4	31.2	1-1/2
B-6	6-21-62	6-28-62	748	26.6	12.0	10.7	11.3	36.0	31.8	33.8	33.4	30.6	31.5	1-1/2
B-7	6-29-62	7- 9-62	755	26.4	13.0	10.0	11.2	36.0	31.2	32.9	31.4	30.2	30.8	1
B-8	6/29/62	7- 9-62	756	27.0	12.2	10.2	11.3	34.8	31.8	33.2	33.0	30.8	31.7	1
Current Machine Average				26.5			11.3			33.7			31.1	
Cumulative Machine Average				26.8			11.4			35.8			32.8	
Machine Factor, %				98.8			99.5			93.9			94.6	
Machine Index, %				97.2			110.8			92.1			93.7	

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
C-1	5-26-62	6- 5-62	130	28.4	10.5	9.9	10.1	31.8	27.6	29.9	27.6	25.2	26.4	1-1/2
C-2	5-26-62	6- 5-62	131	28.3	10.5	9.8	10.2	32.4	27.0	28.9	27.2	25.6	26.2	1-1/2
C-3	5-26-62	6- 5-62	132	26.3	10.0	9.0	9.5	29.4	25.8	28.2	25.8	23.6	24.7	1-1/2
C-4	5-26-62	6- 5-62	133	27.4	10.4	9.8	10.1	28.2	24.6	26.9	26.0	22.4	24.0	1-1/2
C-5	5-26-62	6-22-62	134	28.2	10.9	9.9	10.3	45.0	34.2	41.9	38.2	33.4	36.4	1-1/2
C-6	5-26-62	6-22-62	135	27.8	10.8	8.8	10.0	42.6	34.8	39.6	38.0	35.2	36.3	1-1/2
C-7	5-26-62	6-22-62	136	27.8	10.7	9.3	10.0	42.0	34.8	37.9	38.4	31.8	35.4	1-1/2
C-8	5-26-62	6-22-62	137	28.2	10.8	9.2	10.1	43.2	36.0	39.7	37.8	33.8	35.4	1-1/2
Current Machine Average				27.8			10.0			34.1			30.6	
Cumulative Machine Average				27.7			9.9			33.8			29.6	
Machine Factor, %				100.1			101.3			100.8			103.3	
Machine Index, %				102.0			98.0			93.3			92.3	

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D

D-1	5-18-62	6-13-62	--	26.4	10.3	9.9	10.0	37.2	34.2	35.8	35.4	32.0	33.4	1
D-2	6- 2-62	6-13-62	--	27.3	10.2	9.8	10.0	39.6	35.4	37.7	35.0	33.4	33.9	1
D-3	6- 4-62	6-13-62	--	26.6	10.2	9.8	10.0	38.4	34.8	36.4	33.6	31.4	32.5	1-1/2
D-4	6- 7-62	6-25-62	--	26.5	10.2	9.8	10.0	37.8	34.8	36.4	34.0	31.0	32.7	1
D-5	6-13-62	6-25-62	--	26.9	10.8	10.1	10.4	38.4	33.0	34.8	30.2	28.0	29.0	1
D-6	6-19-62	6-25-62	--	27.4	11.0	10.2	10.6	34.8	33.6	34.3	31.0	28.4	29.2	1-1/2
D-7	7- 9-62	7-24-62	--	26.7	10.2	9.8	10.0	39.6	36.0	37.4	36.4	34.2	35.8	1
D-8	7-10-62	7-24-62	--	26.5	10.1	9.5	9.9	41.4	38.4	39.4	36.4	33.6	35.2	1
D-9	7-11-62	7-24-62	--	26.9	10.3	10.0	10.2	40.2	37.8	39.5	36.8	34.4	35.7	1
D-10	7-16-62	7-24-62	--	26.8	10.2	10.0	10.1	39.2	37.2	38.2	35.4	33.4	34.5	1-1/2
Current Machine Average				26.8			10.1			37.0			33.2	
Cumulative Machine Average				27.0			10.2			37.2			34.1	
Machine Factor, %				99.3			98.9			99.4			97.3	
Machine Index, %				98.4			98.8			101.1			100.2	

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
E-1	6-18-62	6-28-62	52	27.7	10.0	9.8	9.9	40.8	37.8	40.0	37.2	35.0	36.0	1-1/2
E-2	6-18-62	6-28-62	53	27.6	10.1	9.7	10.0	42.6	37.2	40.0	37.4	36.0	36.7	1-1/2
E-3	6-25-62	7- 6-62	54	27.7	10.0	9.6	9.9	41.4	39.0	40.0	37.6	36.4	37.3	1-1/2
E-4	6-25-62	7- 6-62	55	28.2	10.3	9.8	10.1	41.4	37.8	40.3	36.4	33.4	34.9	1-1/2
Current Machine Average				27.8			10.0			40.0			36.2	
Cumulative Machine Average				27.0			10.1			39.4			35.4	
Machine Factor, %				103.1			98.9			101.6			102.2	
Machine Index, %				102.1			97.3			109.5			109.3	

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
June and July, 1962

F-1	5-22-62	5-28-62	314	26.8	11.0	10.0	10.6	41.4	39.6	40.6	37.8	35.6	36.6	1
F-2	5-30-62	6- 5-62	315	26.5	11.0	10.2	10.6	39.6	36.0	37.7	36.8	32.6	34.2	1-1/2
F-3	6- 7-62	6-13-62	316	26.8	11.2	9.0	10.5	40.8	38.4	39.8	37.0	33.8	35.2	1-1/2
F-4	6-15-62	6-21-62	317	27.1	11.3	10.9	11.0	39.6	35.4	37.2	34.8	32.4	33.2	1/2
F-5	6-22-62	7- 3-62	318	27.1	11.5	10.9	11.1	40.2	35.4	37.7	33.8	31.6	32.4	1-1/2
F-6	6-27-62	7- 5-62	319	26.8	11.0	10.0	10.5	42.6	34.8	39.5	36.4	35.2	35.6	1-1/2
F-7	7-18-62	7-23-62	320	26.8	11.8	10.7	11.1	39.6	35.4	37.3	36.8	34.2	35.6	1
Current Machine Average				26.8			10.8			38.5			34.7	
Cumulative Machine Average				26.6			10.7			38.6			34.8	
Machine Factor, %				100.8			100.9			99.9			99.7	
Machine Index, %				98.6			105.3			105.4			104.7	

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
G-1	5-22-62	6-11-62	2	28.7	11.7	10.9	11.2	36.6	34.8	35.6	35.8	32.8	34.4	1-1/2
G-2	5-25-62	6-11-62	3	26.0	11.3	10.0	10.7	31.8	30.0	30.8	32.6	30.4	31.6	Min.
G-3	5-29-62	6-11-62	4	27.3	11.1	10.1	10.4	36.6	32.4	33.7	33.0	31.2	32.5	1-1/2
G-4	5-29-62	6-11-62	5	27.7	11.0	10.2	10.8	36.6	34.2	35.6	34.0	31.6	33.0	1-1/2
Current Machine Average				27.4			10.8			34.0			32.8	
Cumulative Machine Average				26.4			9.4			35.3			32.8	
Machine Factor, %				103.9			114.3			96.1			100.0	
Machine Index, %				100.8			105.2			92.8			99.1	

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
June and July, 1962

H-1	5-22-62	5-31-62	729	28.2	10.9	10.0	10.4	36.6	32.4	34.6	31.6	30.0	30.8	1
H-2	5-22-62	5-31-62	730	27.8	10.8	10.0	10.2	36.0	33.6	35.2	34.4	33.0	33.6	1-1/2
H-3	6- 4-62	6-18-62	737	28.0	11.0	10.3	10.8	37.2	35.4	36.0	31.6	30.8	31.2	1/2
H-4	6- 4-62	6-18-62	738	28.2	11.0	10.5	10.9	39.0	35.4	36.8	33.4	31.2	32.5	1-1/2
H-5	6-19-62	6-28-62	745	26.3	11.2	10.2	10.8	36.6	30.0	33.5	31.6	27.8	29.4	1
H-6	6-19-62	6-28-62	746[a]	26.5	11.0	10.3	10.7	37.8	30.6	34.4	33.0	30.0	31.4	1
H-7	7- 3-62	7-11-62	753[a]	27.1	11.1	10.0	10.7	38.4	34.8	36.0	33.0	31.6	32.4	1-1/2
H-8	7- 3-62	7-11-62	754[a]	27.1	11.1	10.0	10.6	37.8	32.4	35.0	33.6	32.6	33.0	1-1/2
Current Machine Average				27.4			10.6			35.2			31.8	
Cumulative Machine Average				28.1			11.0			36.1			31.8	
Machine Factor, %				97.3			97.0			97.6			100.0	
Machine Index, %				100.6			103.9			96.2			95.9	

[a]These rolls were both identified by the number 753 at the mill. Since the date made was also the same for both rolls, it was not possible to distinguish one roll from the other on the basis of information given on the rolls or on the basis of the information given on the date sheets received from the mill. The roll numbers 753 and 754 have therefore been arbitrarily assigned at the Institute.

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
I-1	5-[illegible]8-62	5-28-62	362	27.4	10.1	9.3	9.8	40.2	33.6	37.0	36.8	32.6	34.5	1-1/2
I-2	5-16-62	5-28-62	363	28.4	11.8	11.0	11.2	39.0	32.4	36.6	36.8	35.0	35.8	1-1/2
I-3	5-20-62	5-28-62	364	28.2	11.9	11.0	11.5	36.6	35.4	35.9	35.0	32.4	33.8	Min.
I-4	6- 5-62	6-26-62	365	26.0	11.5	10.8	11.1	39.6	34.8	37.7	34.6	33.2	33.9	1-1/2
I-5	6-15-62	6-26-62	366	29.1	12.2	11.6	11.9	45.0	37.8	42.2	41.0	36.6	38.8	1
I-6	6-18-62	6-26-62	367	27.4	11.5	11.0	11.2	42.0	36.6	38.6	36.6	34.6	35.8	1
I-7	7- 5-62	7-16-62	368	27.4	11.1	10.8	10.9	40.8	37.2	39.0	37.0	34.6	35.8	1
I-8	7-11-62	7-23-62	369	26.4	11.6	10.6	11.0	43.8	38.4	40.3	38.4	37.0	37.7	1-1/2
I-9	7-16-62	7-23-62	370	25.7	11.3	10.7	10.9	42.0	34.2	37.0	37.6	34.6	35.8	1-1/2
Current Machine Average				27.3			11.1			38.3			35.8	
Cumulative Machine Average				28.3			11.1			40.5			37.1	
Machine Factor, %				96.7			100.0			94.5			96.4	
Machine Index, %				100.4			108.1			104.6			108.0	

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
June and July, 1962

J-1	4-10-62	5-28-62	58	27.0	10.0	9.2	9.7	31.2	30.0	30.8	30.6	29.4	30.3	1-1/2
J-2	4-18-62	5-28-62	59	26.6	9.9	8.9	9.2	30.6	26.4	28.2	28.0	26.0	27.0	1-1/2
J-3	5- 8-62	6- 8-62	60	27.7	9.9	9.1	9.4	32.4	31.2	31.7	31.6	29.6	30.2	1-1/2
J-4	5-10-62	6- 8-62	61	27.2	10.2	9.9	10.0	33.6	29.4	31.7	30.8	28.8	30.0	1-1/2
J-5	5-13-62	6- 8-62	62	27.7	10.5	9.9	10.1	34.2	30.0	32.0	32.8	30.6	31.9	1-1/2
J-6	5-16-62	6- 8-62	63	26.5	10.0	9.2	9.8	33.0	31.8	32.3	34.8	32.6	33.4	1-1/2
J-7	5-19-62	6- 8-62	64	27.4	10.0	8.9	9.6	33.6	30.6	32.0	33.0	31.8	32.3	1-1/2
J-8	5-20-62	6- 8-62	65	26.1	9.1	8.7	8.9	33.0	30.0	31.3	30.8	29.0	30.0	1-1/2
J-9	6- 8-62	7-17-62	66	25.7	10.0	9.0	9.4	31.8	27.6	29.9	32.2	30.6	31.4	1-1/2
J-10	6-10-62	7-17-62	67	26.5	10.3	9.2	9.9	33.6	29.4	31.3	32.4	29.0	30.3	1-1/2
J-11	6-12-62	7-17-62	68	27.2	10.0	9.1	9.7	36.6	30.0	33.0	33.6	31.6	32.4	1-1/2
J-12	6-14-62	7-17-62	69	27.7	10.2	9.9	10.0	35.4	34.2	34.6	35.0	32.0	33.6	1-1/2
Current Machine Average				26.9			9.7			31.6			31.1	
Cumulative Machine Average				27.5			9.7			33.0			31.8	
Machine Factor, %				98.0			100.0			95.6			97.7	
Machine Index, %				98.9			94.3			86.3			93.8	

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m. lb./in.
K-1	6- 2-62	6-25-62	--	27.1	10.3	9.8	10.0	38.4	34.2	37.1	36.8	33.4	35.0	1
K-2	6- 5-62	6-25-62	--	26.4	10.0	9.6	9.8	40.2	34.8	37.4	37.8	31.8	33.5	1
K-3	6- 9-62	6-13-62	--	26.8	10.8	10.0	10.3	38.4	34.2	36.0	33.2	29.8	31.3	1
K-4	6-12-62	6-25-62	--	26.8	10.0	9.7	9.9	39.0	33.6	36.5	35.0	30.4	31.9	1
K-5	7- 7-62	7-24-62	--	26.7	10.2	9.8	10.0	44.4	38.4	41.0	36.4	34.2	35.4	1
K-6	7-12-62	7-24-62	--	26.2	10.0	9.5	9.8	43.8	39.0	42.0	39.2	37.6	38.2	1-1/2
K-7	7-13-62	7-24-62	--	27.1	10.8	9.9	10.3	40.2	37.8	39.0	36.6	34.6	35.6	1
K-8	7-18-62	7-24-62	--	26.8	10.8	10.0	10.4	40.8	36.6	38.5	34.2	32.2	33.2	1
Current Machine Average				26.8			10.1			38.4			34.3	
Cumulative Machine Average				26.6			10.2			37.6			33.9	
Machine Factor, %				100.6			98.6			102.1			101.0	
Machine Index, %				98.4			98.4			105.1			103.5	

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
June and July, 1962

L-1	5-21-62	5-29-62	15	27.8	11.1	10.8	10.9	37.2	33.6	35.2	35.0	33.6	34.1	1/2
L-2	5-21-62	5-29-62	16	27.6	11.0	10.2	10.8	36.0	33.0	34.2	35.8	33.6	34.6	1
L-3	5-21-62	5-29-62	17	28.2	11.1	10.5	11.0	37.8	32.4	34.2	35.0	31.4	33.8	1-1/2
L-4	5-21-62	5-29-62	18	27.7	11.0	10.1	10.7	36.6	33.0	34.8	34.8	32.2	33.6	1-1/2
L-5	7- 2-62	7-23-62	19	27.2	11.1	10.1	10.8	36.6	34.2	35.8	--[a]	--[a]	--[a]	--[a]
L-6	7- 2-62	7-23-62	20	26.9	11.0	10.1	10.8	37.2	33.0	35.3	--[a]	--[a]	--[a]	--[b]
L-7	7- 2-62	7-23-62	21	26.9	11.5	10.1	10.8	37.2	34.2	35.9	32.4	29.6	30.9	--[c]
L-8	7- 2-62	7-23-62	22	27.1	11.2	10.4	10.8	37.8	34.2	36.0	32.2	30.0	30.7	--
Current Machine Average				27.4			10.8			35.2			32.9	
Cumulative Machine Average				28.1			9.6			33.5			29.8	
Machine Factor, %				97.5			112.8			105.1			110.6	
Machine Index, %				100.7			105.8			96.1			99.4	

[a]Single-face flat crush could not be determined because the medium fractured even at a speed of 100 f.p.m. with minimum tension.
[b]Maximum speed at which this roll could be corrugated with minimum tension was 275 f.p.m.
[c]Maximum speed at which this roll could be corrugated with minimum tension was 200 f.p.m.

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
M-1	5-31-62	6-19-62	F-1	27.1	10.0	9.2	9.8	36.6	34.2	35.8	32.4	31.4	31.8	1-1/2
M-2	5-31-62	6-19-62	F-2	26.7	10.2	9.5	9.9	36.6	31.8	35.0	33.4	29.8	31.7	1-1/2
M-3	6- 1-62	6-19-62	F-3	26.9	11.0	9.5	10.2	37.8	33.6	35.2	32.4	30.6	31.4	1-1/2
M-4	6- 1-62	6-19-62	F-4	27.5	10.6	10.0	10.2	34.8	32.4	33.2	33.0	30.0	32.0	1-1/2
Current Machine Average				27.0			10.0			34.8			31.7	
Cumulative Machine Average				27.0			9.9			34.4			31.9	
Machine Factor, %				100.0			101.1			101.2			99.4	
Machine Index, %				99.3			97.7			95.1			95.8	

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
N-1	5-23-62	6- 7-62	4408	26.6	10.2	10.0	10.0	39.6	35.4	37.9	33.6	32.6	33.2	1-1/2
N-2	5-25-62	6- 7-62	4828	26.3	10.4	10.0	10.1	37.8	36.0	36.8	37.2	34.6	35.3	1-1/2
N-3	6- 2-62	7- 5-62	346	27.4	11.0	10.2	10.6	38.4	36.0	37.4	33.4	31.4	32.8	1-1/2
N-4	6-11-62	7-19-62	2282	26.4	10.1	9.9	10.0	40.8	33.0	37.0	32.8	31.0	32.0	1-1/2
N-5	6-13-62	7- 5-62	2736	26.9	10.9	10.1	10.6	37.8	35.4	35.9	36.0	33.6	35.0	1-1/2
N-6	6-14-62	7-19-62	2914	27.1	10.6	10.0	10.3	39.0	37.2	37.9	36.6	34.4	35.6	1-1/2
N-7	6-15-62	7-19-62	3122	26.9	11.0	10.5	10.9	37.8	36.0	37.1	36.2	33.0	34.0	1-1/2
N-8	6-22-62	7-19-62	5881	26.1	10.5	10.0	10.1	39.0	35.4	37.1	34.0	32.0	32.9	1-1/2
Current Machine Average				26.7			10.3			37.1			33.8	
Cumulative Machine Average				26.9			10.4			36.3			33.1	
Machine Factor, %				99.3			98.9			102.3			102.1	
Machine Index, %				98.0			100.8			101.5			102.2	

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
June and July, 1962

O-1	5-19-62	5-28-62	725	27.4	12.0	10.9	11.2	36.6	34.8	35.5	35.8	32.0	33.3	1
O-2	5-19-62	5-28-62	726	26.1	11.0	10.1	10.5	40.8	33.6	37.1	33.8	32.0	33.0	1-1/2
O-3	6- 4-62	6-12-62	733	26.8	10.2	9.6	9.9	40.2	31.2	36.4	36.8	33.6	35.2	1-1/2
O-4	6- 4-62	6-12-62	734	27.4	10.3	9.5	9.9	37.2	36.6	37.0	34.6	30.6	33.2	1
O-5	6-16-62	6-22-62	741	26.2	10.1	9.7	9.8	42.6	33.0	37.3	35.4	31.0	32.9	1
O-6	6-16-62	6-22-62	742	26.0	10.0	9.1	9.7	41.4	35.4	39.0	33.6	30.8	32.2	1
O-7	6-25-62	7- 3-62	749	27.0	10.2	10.0	10.0	44.4	37.2	40.3	39.0	35.8	37.3	1-1/2
O-8	6-25-62	7- 3-62	750	27.5	10.1	9.1	9.9	44.4	37.2	41.6	41.4	36.8	39.3	1-1/2
O-9	7-13-62	7-20-62	757	27.8	10.2	9.9	10.0	38.4	34.8	36.5	36.2	32.0	34.4	1-1/2
O-10	7-13-62	7-20-62	758	28.0	10.0	9.2	9.9	37.2	34.8	36.1	38.4	33.6	35.7	1-1/2
Current Machine Average				27.0			10.1			37.7			34.7	
Cumulative Machine Average				27.1			10.2			36.9			32.2	
Machine Factor, %				99.9			99.5			102.2			107.8	
Machine Index, %				99.2			98.7			103.0			104.6	

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
P-1	5-15-62	6- 6-62	415	26.5	11.0	10.1	10.3	37.8	35.4	36.8	35.6	32.8	34.5	1-1/2
P-2	5-23-62	6- 6-62	682	27.1	10.0	9.8	9.9	40.8	35.4	39.0	35.8	33.4	34.8	1-1/2
P-3	6- 1-62	6-20-62	1	26.8	10.2	9.2	9.8	41.4	35.4	38.0	37.4	35.0	36.2	1/2
P-4	6- 7-62	7-11-62	172	27.7	10.1	9.7	10.0	39.6	34.8	37.2	--[a]	--[a]	--[a]	--[a]
P-5	6-16-62	7-11-62	459	26.3	9.5	9.0	9.1	34.2	32.4	33.2	33.4	31.4	32.2	Min.
P-6	6-26-62	7-11-62	801	26.8	10.9	10.0	10.5	41.4	36.0	38.3	35.8	34.0	35.0	1
P-7	6-28-62	7-11-62	868	25.7	10.5	10.0	10.1	39.6	33.0	35.9	35.2	33.4	34.1	1
Current Machine Average				26.7			10.0			36.9			34.5	
Cumulative Machine Average				26.8			9.8			37.2			34.9	
Machine Factor				99.8			101.8			99.3			98.7	
Machine Index, %				98.1			97.3			101.0			104.0	

[a]Roll could not be corrugated because it was damaged in shipment; hence there are no single-face flat crush or runnability data for this roll.

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q

Q-1	5-22-62	5-28-62	19	26.5	11.0	10.2	10.6	33.6	30.6	32.8	30.4	27.8	29.5	1-1/2
Q-2	5-27-62	6- 4-62	20	26.0	10.5	10.0	10.2	35.4	31.8	33.7	28.8	28.4	28.6	1-1/2
Q-3	6- 6-62	6- 7-62	21	26.3	10.2	10.0	10.1	34.8	32.4	34.1	29.6	28.4	29.2	1-1/2
Q-4	6- 9-62	6-15-62	22	27.1	10.7	10.1	10.3	35.4	32.4	33.8	34.0	32.0	32.6	1-1/2
Q-5	6-15-62	6-21-62	23	25.9	9.9	9.2	9.7	38.4	34.2	36.2	35.8	31.4	33.1	1-1/2
Q-6	6-25-62	7- 2-62	24	26.7	11.0	10.1	10.4	36.6	33.6	34.9	32.0	29.4	30.5	1-1/2
Q-7	6-30-62	7- 6-62	25	26.3	10.1	9.7	10.0	38.4	36.0	36.7	33.6	32.4	32.8	1-1/2
Q-8	7-10-62	7-12-62	26	31.5	10.1	10.0	10.0	39.0	36.0	37.7	34.0	31.8	33.1	1-1/2
Q-9	7-15-62	7-19-62	27	26.8	10.9	10.1	10.5	34.2	30.6	32.0	30.4	28.0	29.4	1-1/2
Current Machine Average				27.0			10.2			34.7			31.0	
Cumulative Machine Average				26.2			10.1			33.9			30.5	
Machine Factor, %				103.2			101.4			102.2			101.6	
Machine Index, %				99.2			99.6			94.8			93.5	

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
R-1	6- 1-62	6-13-62	--	26.8	11.0	10.2	10.6	34.8	31.8	33.6	32.8	31.0	32.0	1
R-2	6- 6-62	6-13-62	--	26.0	10.5	9.9	10.2	37.2	33.6	35.2	34.8	32.2	33.2	1
R-3	6-11-62	6-25-62	--	27.1	10.3	10.0	10.2	37.8	34.2	35.9	34.2	31.2	32.6	1
R-4	6-13-62	6-25-62	--	27.4	11.1	10.2	10.7	37.2	33.0	36.0	35.2	32.8	34.0	1
R-5	7- 6-62	7-24-62	--	27.3	10.9	10.3	10.6	42.0	37.8	40.0	36.0	34.4	35.4	1
R-6	7-11-62	7-24-62	--	27.3	10.9	10.3	10.6	40.2	34.8	37.1	36.2	34.8	35.4	1
R-7	7-14-62	7-24-62	--	27.9	10.8	10.2	10.6	40.2	37.8	38.8	37.4	33.6	36.2	1/2
R-8	7-17-62	7-24-62	--	26.8	10.6	10.0	10.3	42.6	33.0	37.9	37.2	32.6	34.7	1/2
Current Machine Average				27.1			10.5			36.8			34.2	
Cumulative Machine Average				27.4			10.3			37.3			33.8	
Machine Factor, %				98.8			101.4			98.7			101.1	
Machine Index, %				99.4			102.2			100.6			103.2	

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE S
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
S-1	5-15-62	6-15-62	207	26.7	11.0	10.3	10.7	40.8	33.0	36.5	36.4	33.4	34.6	1
S-2	5-22-62	6-15-62	208	27.1	10.2	9.8	10.0	40.2	37.2	38.8	36.6	34.2	35.6	1-1/2
S-3	6- 5-62	6-15-62	209	27.4	10.4	10.0	10.2	37.2	36.0	36.2	35.4	32.6	33.8	1
S-4	6-16-62	7-18-62	210	26.8	10.2	9.8	10.0	40.8	34.2	38.3	34.2	32.6	33.2	1-1/2
S-5	6-19-62	7-18-62	211	27.9	11.0	10.0	10.6	37.2	34.2	35.5	34.6	32.4	33.2	1
S-6	6-24-62	7-18-62	212	26.5	10.5	10.0	10.3	34.8	31.8	33.0	30.2	28.0	29.0	1
S-7	7- 3-62	7-18-62	213	27.1	10.2	9.8	10.0	39.6	37.8	38.6	36.0	34.8	35.4	1
Current Machine Average				27.1			10.3			36.7			33.6	
Cumulative Machine Average				26.8			10.5			35.1			31.6	
Machine Factor, %				100.9			98.1			104.6			106.2	
Machine Index, %				99.4			100.2			100.3			101.3	

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE T
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
T-1	5-28-62	6- 5-62	497	26.0	9.6	8.9	9.1	36.0	33.0	34.3	30.8	28.8	29.8	Min.
T-2	6- 1-62	6-11-62	498	26.0	9.9	9.0	9.2	37.2	33.0	35.4	31.2	30.0	30.8	1-1/2
T-3	6- 9-62	6-18-62	499	28.2	9.8	8.8	9.1	35.4	32.4	34.0	33.0	30.0	31.3	1-1/2
T-4	6-11-62	6-18-62	500	28.1	9.2	8.8	9.0	35.4	33.6	34.1	30.6	29.6	30.2	1-1/2
T-5	6-29-62	7- 9-62	501	27.0	10.0	8.9	9.5	36.0	31.2	33.8	31.4	28.0	30.2	1/2
T-6	6-29-62	7- 9-62	502	27.0	9.3	8.7	9.0	40.8	38.4	39.7	36.4	34.4	35.3	1/2
T-7	7-12-62	7-19-62	503	26.3	10.5	9.0	9.7	38.4	33.0	36.1	31.8	29.2	31.0	1-1/2
Current Machine Average				27.0			9.2			35.3			31.2	
Cumulative Machine Average				26.6			9.1			36.3			32.2	
Machine Factor, %				101.2			101.3			97.3			96.9	
Machine Index, %				99.0			90.2			96.6			94.2	

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U
June and July, 1962

U-1	5-22-62	5-28-62	19	26.0	10.0	9.0	9.4	36.6	32.4	34.1	32.8	30.6	31.5	1-1/2
U-2	5-27-62	6- 4-62	20	25.7	9.9	9.0	9.6	36.6	33.6	35.3	32.0	30.4	31.3	1-1/2
U-3	6- 2-62	6- 7-62	21	26.9	10.2	9.4	10.0	35.4	31.8	33.8	31.4	29.2	30.7	1-1/2
U-4	6- 9-62	6-15-62	22	26.9	9.8	8.9	9.2	40.2	35.4	38.2	33.4	31.6	32.4	1-1/2
U-5	6-15-62	6-21-62	23	25.3	9.8	9.0	9.5	33.0	30.0	31.7	30.2	28.2	29.0	1-1/2
U-6	6-25-62	7- 2-62	24	26.8	10.5	9.9	10.1	38.4	34.2	35.8	33.8	32.4	33.4	1-1/2
U-7	6-30-62	7- 6-62	25	27.4	9.5	8.5	9.1	37.2	34.8	36.5	32.4	31.4	31.9	1-1/2
U-8	6-26-62	7-17-62	26	30.9	9.9	9.0	9.2	47.4	40.8	43.4	43.2	41.2	42.0	1-1/2
U-9	7-15-62	7-19-62	27	25.8	10.3	9.0	9.5	35.4	30.0	32.6	32.4	30.2	30.9	1-1/2
Current Machine Average				26.9			9.5			35.7			32.6	
Cumulative Machine Average				26.6			9.6			36.4			32.0	
Machine Factor, %				101.1			99.0			98.1			101.6	
Machine Index, %				98.6			92.8			97.6			98.3	

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE V
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
V-1	6-27-62	7- 5-62	751	28.1	10.3	9.9	10.1	38.4	33.6	35.5	31.4	30.0	30.8	1-1/2
V-2	6-27-62	7- 5-62	752	27.3	10.8	10.0	10.4	36.6	34.8	35.8	34.4	31.6	32.8	1-1/2
V-3	7-16-62	7-20-62	759	27.6	11.0	10.8	10.9	40.8	36.6	38.3	36.0	33.0	34.8	1-1/2
V-4	7-16-62	7-20-62	760	27.4	11.0	10.2	10.8	40.8	32.4	35.4	35.2	34.2	34.7	1-1/2
Current Machine Average				27.6			10.5			36.2			33.3	
Cumulative Machine Average				27.4			10.4			36.8			32.4	
Machine Factor, %				100.7			101.1			98.6			102.7	
Machine Index, %				101.3			102.8			99.1			100.4	

TABLE XXV

SUMMARY OF TEST RESULTS FOR MACHINE W
June and July, 1962

W-1	5-18-62	6- 5-62	133	27.4	9.9	9.1	9.7	36.6	30.0	33.7	34.0	30.6	32.3	1
W-2	5-18-62	6- 5-62	134	27.9	10.0	9.1	9.7	36.6	33.6	35.0	30.6	28.0	29.2	1/2
W-3	5-18-62	6- 5-62	135	29.8	10.1	9.3	9.8	37.8	36.6	37.2	33.4	29.6	32.4	Min.
W-4	5-18-62	6- 5-62	136	29.9	10.1	9.0	9.8	39.6	33.6	37.2	34.4	33.0	33.7	Min.
W-5	6- 7-62	6-22-62	137	26.9	11.0	9.7	10.3	35.4	33.0	34.1	34.8	29.2	31.3	1-1/2
W-6	6- 7-62	6-22-62	138	26.9	10.8	9.3	10.0	36.6	33.0	35.2	33.4	31.4	32.2	1-1/2
W-7	6- 7-62	6-22-62	139	27.4	11.0	9.8	10.4	37.2	34.2	36.2	31.2	29.6	30.6	1-1/2
W-8	6- 7-62	6-22-62	140	26.5	10.0	9.2	9.7	36.0	33.0	34.1	33.8	32.2	32.8	1-1/2
Current Machine Average				27.8			9.9			35.3			31.8	
Cumulative Machine Average				27.8			9.9			35.9			33.0	
Machine Factor, %				100.0			100.0			98.3			96.3	
Machine Index, %				102.2			97.0			96.6			96.0	

TABLE XXVI

SUMMARY OF TEST RESULTS FOR MACHINE X
June and July, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
X-1	5- 3-62	5- 8-62	494	27.9	10.9	10.1	10.4	40.8	37.8	39.0	37.4	34.4	36.1	1-1/2
X-2	5-21-62	6-18-62	495	27.3	10.8	10.0	10.4	39.0	37.2	38.3	33.6	31.6	32.6	1-1/2
X-3	5-27-62	6-18-62	496	27.7	10.7	10.1	10.5	41.4	38.4	39.2	35.0	33.6	34.0	1-1/2
X-4	6- 5-62	7-11-62	497	26.8	10.0	9.5	9.9	40.8	37.2	39.7	36.8	33.0	35.6	1-1/2
X-5	6-19-62	7- 9-62	498	27.9	11.2	10.5	10.8	40.2	34.2	36.5	36.2	33.0	34.6	1
X-6	6-23-62	7- 9-62	499	28.2	11.2	10.4	10.9	37.8	34.8	36.1	35.4	32.4	34.0	1-1/2
X-7	7- 1-62	7-18-62	500	28.2	10.3	10.0	10.1	45.0	37.8	41.0	38.4	35.6	36.6	1-1/2
X-8	7- 3-62	7-18-62	501	27.1	10.6	10.0	10.3	39.6	36.6	37.7	35.6	32.2	33.8	1-1/2
Current Machine Average				27.6			10.4			38.4			34.7	
Cumulative Machine Average				27.2			10.3			37.9			35.0	
Machine Factor, %				101.6			101.2			101.3			99.1	
Machine Index, %				101.5			101.7			105.1			104.6	

TABLE XXVII

SUMMARY OF TEST RESULTS FOR MACHINE Y
June and July, 1962

Y-1	6- 5-62	7-20-62	406	27.7	10.8	10.0	10.5	36.6	33.0	34.7	35.2	32.8	33.8	1-1/2
Y-2	7- 1-62	7-20-62	407	27.4	11.0	10.0	10.5	40.8	36.0	38.2	37.8	35.0	37.0	1-1/2
Current Machine Average				27.5			10.5			36.4			35.4	
Cumulative Machine Average				28.4			10.6			37.0			32.8	
Machine Factor, %				96.8			98.5			98.4			108.0	
Machine Index, %				101.1			102.4			99.6			106.8	

test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages". A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXVII are the machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

DISCUSSION OF RESULTS

Show below from Table II are the maximum and minimum current machine averages noted for each test during the current period (June and July, 1962); the current machine average is the average of the results obtained on all rolls submitted from a given machine during the current period. Also given for each test is the current F.K.I. average which is determined by averaging the current machine averages for the current period and is indicative of the test level being maintained by the industry as a whole to the extent that the industry is represented by the participating machines:

	Maximum Current Machine Average	Minimum Current Machine Average	Current F.K.I. Average
Basis wt., lb.	27.8	26.5	27.2
Caliper, pt.	11.3	9.2	10.3
Concora flat crush, p.s.i.	41.2	31.6	36.4
Single-face flat crush, p.s.i.	36.8	30.6	33.3

The runnability data for the 182[a] rolls evaluated during the current period are summarized as follows:

Runnability	Number of Rolls	Percentage of Total Rolls
Less than 600 f.p.m. with minimum tension	4	2.2
600 f.p.m.--minimum tension	6	3.3
600 f.p.m.--1/2 lb. per in. tension	10	5.5
600 f.p.m.--1 lb. per in. tension	48	26.4
600 f.p.m.--1-1/2 lb. per in. tension	114	62.6

[a] One of the 183 rolls received for evaluation during the current period could not be corrugated because it was damaged in shipment.

In Table XXVIII a comparison of Institute and mill Concora flat crush test results obtained on conditioned specimens is given for each machine for the current period. The inclusion of these comparisons is made possible by the fact that interested participants submit their Concora flat crush test results to The Institute of Paper Chemistry. This affords each participant the opportunity to review the level of agreement for his data with the levels shown for the other participants. Data sheets for supplying this information may be obtained from the Institute. Comparisons of this kind are a helpful adjunct to other calibration procedures. Shown in Table XXVIII are (1) the Institute and mill Concora averages for each roll included in these comparisons, (2) the difference between the roll average based on Institute data and that based on mill data, (3) the Institute and mill averages based on all rolls included in the comparison, and (4) the difference between these over-all averages.

The Concora flat crush data shown in Table XXVIII are summarized in Part I of Table XXIX where for each machine the following information is given: (1) Current machine average based on Institute data, (2) current machine average based on mill data, (3) the average difference--that is, the difference between the current machine average based on Institute data and that based on mill data and (4) the maximum difference encountered in comparing Institute and mill test averages for individual rolls. In Part II of Table XXIX the average differences given in Part I have been converted to per cent. Comparative data from the previous two reports are also included in Part II of Table XXIX. It may be seen in Part II of Table XXIX that, for the current period, the highest average difference of 8.2% was associated with Machine J and the lowest of 0.5% with Machine K.

In Table XXX a summary of the agreement between Institute and mill Concora flat crush data is given for the current period, and comparative data

TABLE XXVIII

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR JUNE AND JULY, 1962

Machine A

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
A-1	663	5-24-62	40.6	37.8	-2.8
A-2	664	5-31-62	39.8	40.1	+0.3
A-3	665	6- 7-62	41.6	42.5	+0.9
A-4	666	6-15-62	41.0	40.0	-1.0
A-5	667	6-25-62	40.8	40.6	-0.2
A-6	668	7-13-62	43.1	40.9	-2.2
Current Machine Av.			41.2	40.3	-0.9

Machine B

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
B-1	731	5-31-62	32.3	31.2	-1.1
B-2	732	5-31-62	34.3	32.2	-2.1
B-3	739	6- 4-62	34.1	31.8	-2.3
B-4	740	6- 4-62	33.8	36.5	+2.7
B-5	747	6-21-62	34.9	37.0	+2.1
B-6	748	6-21-62	33.8	36.2	+2.4
B-7	755	6-29-62	32.9	34.3	+1.4
B-8	756	6-29-62	33.2	36.0	+2.8
Current Machine Av.			33.7	34.4	+0.7

Machine D

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
D-1	--	5-18-62	35.8	35.6	-0.2
D-2	--	6- 2-62	37.7	40.8	+3.1
D-4	--	6- 7-62	36.4	37.7	+1.3
D-5	--	6-13-62	34.8	36.4	+1.6
D-6	--	6-19-62	34.3	35.8	+1.5
D-7	--	7- 9-62	37.4	40.1	+2.7
D-8	--	7-10-62	39.4	41.3	+1.9
D-9	--	7-11-62	39.5	43.0	+3.5
D-10	--	7-16-62	38.2	38.5	+0.3
Current Machine Av.			37.1	38.8	+1.7

Machine F

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
F-1	314	5-22-62	40.6	41.0	+0.4
F-2	315	5-30-62	37.7	37.8	+0.1
F-3	316	6- 7-62	39.8	39.6	-0.2
F-4	317	6-15-62	37.2	37.7	+0.5
F-5	318	6-22-62	37.7	42.0	+4.3
F-6	319	6-27-62	39.5	39.6	+0.1
F-7	320	7-18-62	37.3	37.4	+0.1
Current Machine Av.			38.5	39.3	+0.8

Machine H

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
H-1	729	5-22-62	34.6	34.3	-0.3
H-2	730	5-22-62	35.2	34.1	-1.1
H-3	737	6- 4-62	36.0	34.1	-1.9
H-4	738	6- 4-62	36.8	32.5	-4.3
H-5	745	6-19-62	33.5	35.0	+1.5
H-6	746	6-19-62	34.4	36.1	+1.7
H-7	753	7- 3-62	36.0	32.4	-3.6
H-8	754	7- 3-62	35.0	33.1	-1.9
Current Machine Av.			35.2	34.0	-1.2

Machine I

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
I-1	362	5- 8-62	37.0	36.8	-0.2
I-2	363	5-16-62	36.6	36.5	-0.1
I-3	364	5-20-62	35.9	38.0	+2.1
I-4	365	6- 5-62	37.7	37.0	-0.7
I-5	366	6-15-62	42.2	41.4	-0.8
I-6	367	6-18-62	38.6	36.0	-2.6
I-7	368	7- 5-62	39.0	34.4	-4.6
I-8	369	7-11-62	40.3	36.5	-3.8
I-9	370	7-16-62	37.0	36.2	-0.8
Current Machine Av.			38.3	37.0	-1.3

Machine J

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
J-1	58	4-10-62	30.8	31.7	+0.9
J-2	59	4-18-62	28.2	31.9	+3.7
J-3	60	5- 8-62	31.7	32.5	+0.8
J-4	61	5-10-62	31.7	34.1	+2.4
J-5	62	5-13-62	32.0	35.0	+3.0
J-6	63	5-16-62	32.3	38.4	+6.1
J-7	64	5-19-62	32.0	36.7	+4.7
J-8	65	5-20-62	31.3	34.4	+3.1
J-9	66	6-8-62	29.9	33.6	+3.7
J-10	67	6-10-62	31.3	33.5	+2.2
J-11	68	6-12-62	33.0	34.3	+1.3
J-12	69	6-14-62	34.6	34.8	+0.2
Current Machine Av.			31.6	34.2	+2.6

Machine K

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
K-1	--	6- 2-62	37.1	37.9	+0.8
K-2	--	6- 5-62	37.4	37.0	-0.4
K-3	--	6- 9-62	36.0	36.0	0.0
K-4	--	6-12-62	36.5	36.2	-0.3
K-5	--	7- 7-62	41.0	42.8	+1.8
K-6	--	7-12-62	42.0	42.4	+0.4
K-7	--	7-13-62	39.0	36.8	-2.2
K-8	--	7-18-62	38.5	39.5	+1.0
Current Machine Av.			38.4	38.6	+0.2

Machine L

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
L-1	15	5-21-62	35.2	37.4	+2.2
L-2	16	5-21-62	34.2	35.8	+1.6
L-3	17	5-21-62	34.2	34.1	-0.1
L-4	18	5-21-62	34.8	35.3	+0.5
L-5	19	7- 2-62	35.8	37.1	+1.3
L-6	20	7- 2-62	35.3	37.4	+2.1
L-7	21	7- 2-62	35.9	38.8	+2.9
L-8	22	7- 2-62	36.0	37.0	+1.0
Current Machine Av.			35.2	36.6	+1.4

[a]This difference is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXVIII (Continued)

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR JUNE AND JULY, 1962

Machine N

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
N-1	4408	5-23-62	37.9	33.9	-4.0
N-2	4828	5-25-62	36.8	36.2	-0.6
N-3	346	6- 2-62	37.4	34.4	-3.0
N-4	2282	6-11-62	37.0	35.0	-2.0
N-5	2736	6-13-62	35.9	36.2	+0.3
N-6	2914	6-14-62	37.9	35.2	-2.7
N-7	3122	6-15-62	37.1	35.2	-1.9
N-8	5881	6-22-62	37.1	35.4	-1.7
Current Machine Av.			37.1	35.2	-1.9

Machine O

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
O-1	725	5-19-62	35.5	35.1	-0.4
O-2	726	5-19-62	37.1	38.4	+1.3
O-3	733	6- 4-62	36.4	36.1	-0.3
O-4	734	6- 4-62	37.0	37.2	+0.2
O-5	741	6-16-62	37.3	42.4	+5.1
O-6	742	6-16-62	39.0	39.4	+0.4
O-7	749	6-25-62	40.3	42.2	+1.9
O-8	750	6-25-62	41.6	40.8	-0.8
O-9	757	7-13-62	36.5	36.0	-0.5
O-10	758	7-13-62	36.1	35.7	-0.4
Current Machine Av.			37.7	38.3	+0.6

Machine P

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
P-1	415	5-15-62	36.8	39.0	+2.2
P-4	172	6- 7-62	37.2	40.3	+3.1
P-5	459	6-16-62	33.2	35.8	+2.6
P-6	801	6-26-62	38.3	38.3	0.0
P-7	868	6-28-62	35.9	37.0	+1.1
Current Machine Av.			36.3	38.1	+1.8

Machine Q

Q-1	19	5-22-62	32.8	38.2	+5.4
Q-2	20	5-27-62	33.7	37.0	+3.3
Q-3	21	6- 2-62	34.1	34.7	+0.6
Q-4	22	6- 9-62	33.8	37.4	+3.6
Q-5	23	6-15-62	36.2	36.2	0.0
Q-6	24	6-25-62	34.9	32.6	-2.3
Q-7	25	6-30-62	36.7	36.6	-0.1
Q-8	26	7-10-62	37.7	34.0	-3.7
Q-9	27	7-15-62	32.0	31.0	-1.0
Current Machine Av.			34.7	35.3	+0.6

Machine R

R-1	--	6- 1-62	33.6	36.6	+3.0
R-2	--	6- 6-62	35.2	36.8	+1.6
R-3	--	6-11-62	35.9	36.8	+0.9
R-4	--	6-13-62	36.0	37.3	+1.3
R-5	--	7- 6-62	40.0	39.2	-0.8
R-6	--	7-11-62	37.1	40.4	+3.3
R-7	--	7-14-62	38.8	40.7	+1.9
R-8	--	7-17-62	37.9	39.8	+1.9
Current Machine Av.			36.8	38.4	+1.6

Machine S

S-1	207	5-15-62	36.5	35.8	-0.7
S-2	208	5-22-62	38.8	37.6	-1.2
S-3	209	6- 5-62	36.2	37.4	+1.2
S-4	210	6-16-62	38.3	38.0	-0.3
S-5	211	6-19-62	35.5	37.3	+1.8
S-6	212	6-24-62	33.0	35.3	+2.3
Current Machine Av.			36.4	36.9	+0.5

Machine T

T-1	497	5-28-62	34.3	36.7	+2.4
T-2	498	6- 1-62	35.4	36.4	+1.0
T-3	499	6- 9-62	34.0	34.6	+0.6
T-4	500	6-11-62	34.1	35.9	+1.8
T-5	501	6-29-62	33.8	35.9	+2.1
T-6	502	6-29-62	39.7	39.2	-0.5
T-7	503	7-12-62	36.1	36.8	+0.7
Current Machine Av.			35.3	36.5	+1.2

Machine U

U-2	20	5-27-62	35.3	38.2	+2.9
U-3	21	6- 2-62	33.8	36.5	+2.7
U-4	22	6- 9-62	38.2	37.9	-0.3
U-5	23	6-15-62	31.7	35.5	+3.8
U-6	24	6-25-62	35.8	35.5	-0.3
U-7	25	6-30-62	36.5	35.4	-1.1
U-8	26	6-26-62	43.4	41.4	-2.0
U-9	27	7-15-62	32.6	33.5	+0.9
Current Machine Av.			35.9	36.7	+0.8

Machine V

V-1	751	6-27-62	35.5	39.8	+4.3
V-2	752	6-27-62	35.8	36.6	+0.8
V-3	759	7-16-62	38.3	39.4	+1.1
V-4	760	7-16-62	35.4	38.9	+3.5
Current Machine Av.			38.4	39.8	+1.4

Machine X

X-1	494	5- 3-62	39.0	40.4	+1.4
X-2	495	5-21-62	38.3	39.6	+1.3
X-3	496	5-27-62	39.2	40.3	+1.1
X-4	497	6- 5-62	39.7	40.8	+1.1
X-5	498	6-19-62	36.5	38.5	+2.0
X-6	499	6-23-62	36.1	38.8	+2.7
X-7	500	7- 1-62	41.0	40.6	-0.4
X-8	501	7- 3-62	37.7	39.8	+2.1
Current Machine Av.			38.4	39.8	+1.4

[a]This difference is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXIX

PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORA FLAT CRUSH AVERAGES BASED ON INSTITUTE DATA AND THOSE BASED ON MILL DATA

Machine Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
Number of Rolls Compared	6	8	0	9	0	7	0	8	9	12	8	8	0	8	10	5	9	8	6	7	8	4	0	8	0
Concora Flat Crush, p.s.i.																									
Current Machine Av. (Institute)[a]	41.2	33.7	--	37.1	--	38.5	--	35.2	38.3	31.6	38.4	35.2	--	37.1	37.7	36.3	34.7	36.8	36.4	35.3	35.9	36.2	--	38.4	--
Current Machine Av. (Mill)[a]	40.3	34.4	--	38.8	--	39.3	--	34.0	37.0	34.2	38.6	36.6	--	35.2	38.3	38.1	35.3	38.4	36.9	36.5	36.7	38.7	--	39.8	--
Average Difference[b]	-0.9	+0.7	--	+1.7	--	+0.8	--	-1.2	-1.3	+2.6	+0.2	+1.4	--	-1.9	+0.6	+1.8	+0.6	+1.6	+0.5	+1.2	+0.8	+2.5	--	+1.4	--
Maximum Difference[c]	-2.8	+2.8	--	+3.5	--	+4.3	--	-4.3	-4.6	+6.1	-2.2	+2.9	--	-4.0	+5.1	+3.1	+5.4	+3.3	+2.3	+2.4	+3.8	+4.3	--	+2.7	--

PART II: A TABULATION FOR EACH MACHINE OF THE AVERAGE DIFFERENCE (PER CENT) BETWEEN THE CONCORA FLAT CRUSH BASED ON INSTITUTE DATA AND THAT BASED ON MILL DATA

Average Difference, %[d]																									
Current Report (June and July)	-2.2	+2.1	--	+4.6	--	+2.1	--	-3.4	-3.4	+8.2	+0.5	+4.0	--	-5.1	+1.6	+5.0	+1.7	+4.3	+1.4	+3.4	+2.2	+6.9	--	+3.6	--
95th Report (April and May)	+0.5	-7.5	--	-2.2	--	+3.1	--	-3.6	-0.8	+11.7	-0.8	+0.9	--	-6.6	+0.8	+3.5	+2.6	-0.5	+1.7	+2.1	+1.4	--	--	+3.9	--
94th Report (Feb. and March)	0.0	-4.1	--	-0.3	--	+3.1	--	-3.3	-1.8	+5.3	+0.5	+4.1	--	-1.4	+3.3	+2.5	+6.1	+1.4	+1.1	+4.7	+5.1	--	--	+3.2	--

[a] Comparisons based on current machine average include only those rolls for which mill data were submitted.

[b] Average difference is the difference between the current machine average based on Institute test results and that based on mill test results with the Institute test results used as the reference. See Table XXVIII.

[c] Maximum difference is the greatest difference encountered in comparing Institute and mill test averages for individual rolls. See Table XXVIII.

[d] Average difference (per cent) is computed by dividing the average difference in p.s.i. (shown above in Part I of this table) by the Institute current machine average and multiplying the result by 100.

from the previous bimonthly period are also included. The data shown for the current period indicate that agreement between Institute and mill Concora data was good. It may be seen in Table XXX that, for the current period, 5.3% of the comparisons of Institute and mill data differed by 1% or less, 42.1% of the comparisons differed by 2.5% or less, and 84.2% of the comparisons differed by 5% or less; agreement at the 2.5 and 5% levels is comparable to the agreement for the previous period at these levels; however, agreement at the 1% level for the current period is not as good as that noted for the previous perod. The maximum difference of 11.7% noted for the previous period was somewhat higher than the maximum difference of 8.2% noted for the current period.

TABLE XXX

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL
CONCORA FLAT CRUSH DATA

Average Percentage Difference Between Institute and Mill Concora Flat Crush Test Results[a]	Percentage of All Machines Included Within the Indicated Range	
	Previous Period[b]	Current Period[c]
± 1.0	33.3	5.3
± 2.5	55.6	42.1
± 5.0	83.3	84.2
± 10.0	94.4	100.0[d]
± 11.7	100.0	

[a] The average obtained at the Institute was used as the reference in the calculation of the percentage differences.
[b] April and May, 1962.
[c] June and July, 1962.
[d] Maximum percentage difference was 8.2.

THE INSTITUTE OF PAPER CHEMISTRY

W. N. Hubert, Research Aide
Container Section

R. C. McKee, Chief, Container Section